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20. GROWTH AND BEHAVIOUR OF A BLIND GHARIAL *GAVIALIS GANGETICUS* (GMELIN)

(With a text-figure)

INTRODUCTION

During the operation of a large-scale conservation programme for the gharial, we have incubated 1062 eggs collected from the Narayani and Kali rivers in Nepal and the Chambal river in Madhya Pradesh. Occurrence of eye defects, among a total of twelve types of congenital defects, was the most common for eggs collected from the Narayani-Kali-Gandaki rivers originating in Nepal (Singh and Bustard, in prepn.). The various eye defects ranged from simple defects relating only to ciliary muscles to complete absence of one, or more commonly, both eyes. Seven embryos developed without eyes four of which were found dead in the egg. In addition one embryo developed with only the left eye present. The individual reported on here is the only one to have survived. The present paper discusses the case history of the only surviving blind gharial, in particular its growth and behaviour from its hatching in June 1975 to January 1981 a period of about 6 years.

MATERIALS AND METHODS

The individual reported on here hatched from one of seventy-two eggs collected immediately following laying and incubated in hatchery conditions described by Singh (1978) and

Bustard and Singh (in prep.). Besides 40 normal young, one young with defective umbilical constriction, and two, one dead and the other alive, with complete absence of eyes, were surgically removed from their eggs by the second author on 23rd June 1975 after a period of 76 days incubation. The surviving blind hatchling was the heaviest of the brood with a hatching weight of 94.8 g and length 36.0 cm against a mean weight of 75.3 g and length of 35.8 cm (N=40). It had a normal amount of residual yolk. Along with the normal hatchlings the blind hatchling was reared under simulated natural conditions in captivity at the Gharial Research and Conservation Unit, Tikerpada. The normal rearing techniques are described by Bustard (in FAO 1975) and Singh (1978). The blind gharial was always kept in the same pool with its own hatchmates, ten in number, and trained to accept food from the hand ('hand-fed') from the age of three months. (In force-feeding the food is introduced into the mouth and pushed towards the throat when normal swallowing takes place).

OBSERVATIONS

1. *Swimming*: The blind gharial performed typical gharial swimming behaviour using the tail aided by the hind limbs. A peculiarity

observed, however, was that it often showed a circular swimming pattern as if moving around a central point. There was no indication of any preference for clock or anti-clockwise movement.

2. *Hauling out and basking*: Hauling out of the water was extremely rare during the non-winter season and when it did emerge it usually basked on the half submerged pool wall or branches of aquatic plants. When it hauled out of the pool, it usually kept a foot

or the tip of the tail dipped into the water like a temperature sink in thermoregulating gharial (Singh 1978).

3. *Feeding*: As a supplementary diet, commencing about a month after hatching, it was 'force fed' daily with one or two stunned fish of suitable size. When it and its pool mates were 'hand-fed' it exhibited normal behavioural displays including responding to the sound of water splashing in a bucket of fish and opening the jaws when a fish was thrown

TABLE 1
MEASUREMENTS OF THE BLIND GHARIAL
(Length in mm and weight in kg)

| Date | Snout | Snout vent | Tail | Total body length | Weight |
|-----------|-------|------------|------|-------------------|--------|
| 23.6.1975 | — | 167 | 193 | 360 | 0.095 |
| 21.7.1975 | 50.0 | 179 | 218 | 397 | 0.090 |
| 21.6.1976 | 111.0 | 341 | 382 | 723 | 0.580 |
| (1 year) | | | | | |
| 7.6.1977 | 155.0 | 472 | 505 | 977 | 1.550 |
| (2 years) | | | | | |
| 10.7.1978 | 195.0 | 630 | 685 | 1315 | 5.000 |
| (3 years) | | | | | |
| 17.7.1979 | 250.0 | 840 | 780 | 1620 | 10.2 |
| (4 years) | | | | | |
| 16.6.1980 | 280.0 | 950 | 910 | 1860 | 15.4 |
| (5 years) | | | | | |

TABLE 2
MEASUREMENTS FOR NORMAL GHARIAL
(Length in mm and weight in kg)

| Date | Snout | Snout vent | Tail | Total body length | Weight |
|-----------|-------|------------|-------|-------------------|--------|
| Hatchling | 29.7 | 164.8 | 193.0 | 357.9 | 0.075 |
| 1 year | 125 | 517 | 500 | 1017 | 1.9 |
| 2 years | 180 | 738 | 682 | 1420 | 6.9 |
| 3 years | 252 | 1086 | 1010 | 2096 | 23.9 |
| 4 years | 302 | 1368 | 1108 | 2476 | 48.9 |
| 5 years | 326 | 1538 | 1250 | 2788 | 71.8 |

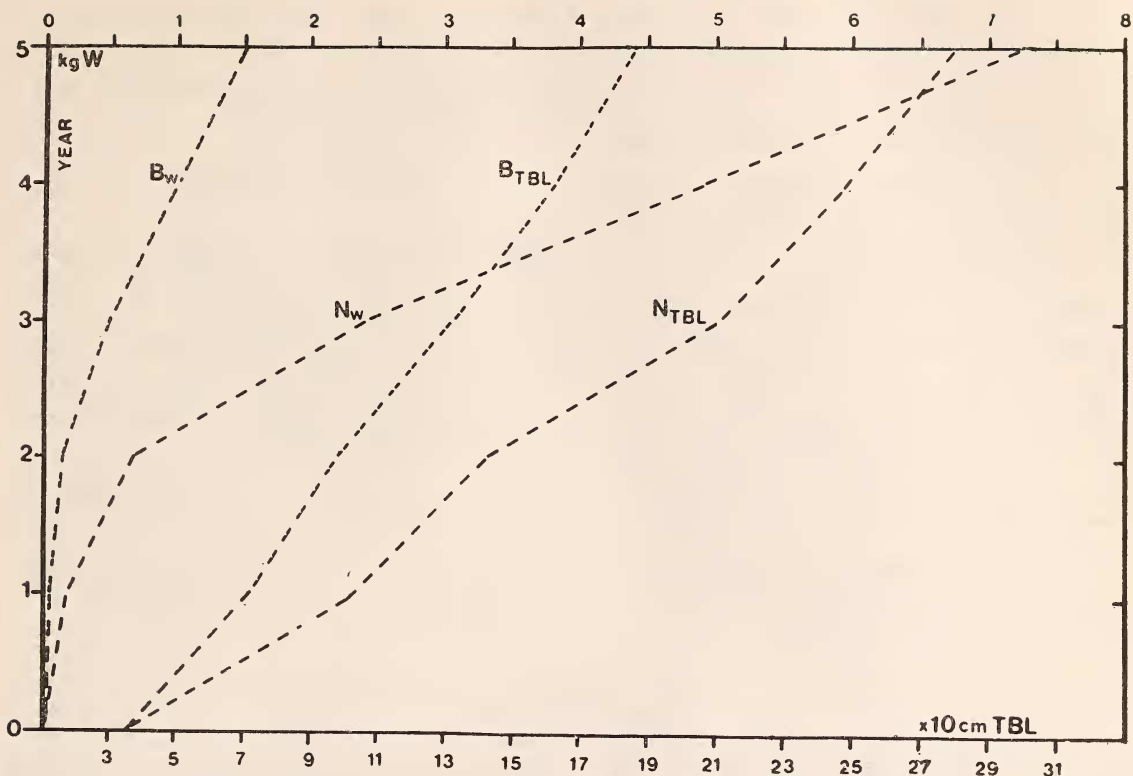


Fig. 1. Comparison of growth in total body length (TBL) and weight (W) between the blind gharial (B) and normal gharial (N) over the first five years of life.

near it. It was further noted that its sense of touch and hearing were even better developed than the already well developed condition in normal animals.

4. *Social relation with other animals*: All its pool-mates, though of similar age soon outgrew it, yet they appeared to be tolerant of the blind individual even at the time of feeding. If it came towards them they preferred to move aside. Similarly, at the time of hauling out, basking and surfacing, if it climbed over the body of others, they did not object. Furthermore, on no occasion have the normal animals been seen to victimise or even show

their 'playful snout-stroking' behaviour (Singh 1978) towards it.

5. *Growth*: Five years' growth data for the blind gharial is presented in Table 1 and for normal gharial in Table 2. As indicated in the Tables, the blind gharial's growth was slow in comparison to normal animals. The growth in weight and length for the blind gharial compared to normal individuals is shown diagrammatically in Figure 1. However, at no time was it underweight with respect to its length.

DISCUSSION

The cause of death of the other blind individuals is not known. The other two without

eyes died after nine days and one month respectively and the one-eyed individual died after twenty days. These individuals were of normal size or slightly smaller.

We are likewise unable to explain the slower growth of the surviving individual whose weight in proportion to its length has been normal throughout (Figure 1). There would appear to be deleterious side effects to blindness quite apart from the inability of such individuals to emerge from the eggs unaided.

We consider the reason for keeping a foot or the tip of the tail in the water when it hauled out on the pool perimeter was to guide

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it back to the water since experiments indicated that once removed from the immediate vicinity of the pool it could relocate it only by trial and error movements.

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21. TRAP USED FOR CATCHING A MUGGER (*CROCODYLUS PALUSTRIS*) FROM NATURE

(With three text-figures)

INTRODUCTION

Between 1977 and 1979, during the breeding season, a female mugger of the Satkoshia Gorge, River Mahanadi, Orissa showed strong sexual attraction towards captive males at the Gharial Research and Conservation Unit (GRACU) which is situated on the banks of the river. On 31 Jan. 1979, the mugger was sighted near the mugger enclosure of GRACU

at mid-night. She was surrounded from all sides with suitable strawed-bamboo mat covers, and then skilfully directed into the mugger enclosure. On August 4, 1980 she broke through the wiremesh wall of the enclosure and returned back to the river. Data collected to this stage have been reported earlier in Singh 1979 and Singh (in press).

During 1980 post-monsoon she again displayed a behaviour suggesting her intention